



# Circularly polarized few-optical-cycle solitons in Kerr media: A complex modified Korteweg-de Vries model

Submitted by Emmanuel Lemoine on Wed, 10/29/2014 - 11:46

Titre	Circularly polarized few-optical-cycle solitons in Kerr media: A complex modified Korteweg-de Vries model
Type de publication	Article de revue
Auteur	Leblond, Hervé [1], Triki, Houria [2], Sanchez, François [3], Mihalache, Dumitru [4]
Editeur	Elsevier
Type	Article scientifique dans une revue à comité de lecture
Année	2012
Langue	Anglais
Date	2012/02/01
Numéro	3
Pagination	356 - 363
Volume	285
Titre de la revue	Optics Communications
ISSN	0030-4018
Mots-clés	Circular polarization [5], Few-cycle pulses [6], Few-cycle solitons [7], mKdV equation [8], Modified Korteweg-de Vries equation [9]
Résumé en anglais	We consider the propagation of few-cycle pulses (FCPs) in cubic nonlinear media exhibiting a "crystal-like" structure, beyond the slowly varying envelope approximation, taking into account the wave polarization. By using the reductive perturbation method we derive from the Maxwell-Bloch-Heisenberg equations, in the long-wave-approximation regime, a non-integrable complex modified Korteweg-de Vries equation describing the propagation of circularly polarized (CP) FCPs. By direct numerical simulations of the governing nonlinear partial differential equation we get robust CP FCPs and we show that the unstable ones decays into linearly polarized half-cycle pulses, whose polarization direction slowly rotates around the propagation axis.
URL de la notice	<a href="http://okina.univ-angers.fr/publications/ua5181">http://okina.univ-angers.fr/publications/ua5181</a> [10]
DOI	10.1016/j.optcom.2011.09.051 [11]
Lien vers le document	<a href="http://dx.doi.org/10.1016/j.optcom.2011.09.051">http://dx.doi.org/10.1016/j.optcom.2011.09.051</a> [11]

## Liens

- [1] <http://okina.univ-angers.fr/herve.leblond/publications>
- [2] [http://okina.univ-angers.fr/publications?f\[author\]=23980](http://okina.univ-angers.fr/publications?f[author]=23980)
- [3] <http://okina.univ-angers.fr/francois.sanchez/publications>
- [4] [http://okina.univ-angers.fr/publications?f\[author\]=8696](http://okina.univ-angers.fr/publications?f[author]=8696)

- [5] [http://okina.univ-angers.fr/publications?f\[keyword\]=9609](http://okina.univ-angers.fr/publications?f[keyword]=9609)
- [6] [http://okina.univ-angers.fr/publications?f\[keyword\]=9610](http://okina.univ-angers.fr/publications?f[keyword]=9610)
- [7] [http://okina.univ-angers.fr/publications?f\[keyword\]=9611](http://okina.univ-angers.fr/publications?f[keyword]=9611)
- [8] [http://okina.univ-angers.fr/publications?f\[keyword\]=9612](http://okina.univ-angers.fr/publications?f[keyword]=9612)
- [9] [http://okina.univ-angers.fr/publications?f\[keyword\]=9613](http://okina.univ-angers.fr/publications?f[keyword]=9613)
- [10] <http://okina.univ-angers.fr/publications/ua5181>
- [11] <http://dx.doi.org/10.1016/j.optcom.2011.09.051>

Publié sur *Okina* (<http://okina.univ-angers.fr>)